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ENVIRONMENTALLY PREFERABLE PRODUCTS (EPPs) AS A TRADE OPPORTUNITY FOR DEVELOPING COUNTRIES

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I. INTRODUCTION

The 1980s witnessed substantial changes in developed country markets resulting from the rising interest in the environment and environmental attributes of products. It is suggested, in this context, that the so-called greening of markets represents new opportunities for developing countries. This assumption is based on the fact that these countries are important producers of natural-based products which often claim to be inherently more environment-friendly than synthetics. Agricultural production, in particular, in these countries is also less polluting than in the developed world. For these reasons, it is argued that developing countries are well placed to supply natural and environment-friendly products. If they take advantage of "green" market opportunities and capitalize on their natural endowment, they may thereby be able to enhance the attainment of their developmental objectives, including:

(a) foreign exchange generation/savings. Exports of EPPs and substitution of less environment-friendly imported products by domestically produced EPPs may have a positive impact on the country's trade balance;

(b) employment and income generation. Production and processing of EPPs may generate additional jobs, particularly in poverty-affected rural areas, where a great part of production generally takes place;

(c) environmental protection and improvement. Even though environmental benefits of EPPs are often linked to their use in developed countries, the environment can also be improved in developing countries through the introduction of more environmentally sound practices and technologies needed for the production of EPPs, or through the use of these products in developing countries themselves. In both cases less environmental damage in terms of pollution and wastes is likely to occur, and natural resources may be better preserved.

As yet, markets for EPPs are mostly to be found in developed countries, which is due to the generally higher environmental consciousness in that part of the world resulting from, among other things, serious local environmental problems. Another factor may be level of income, which makes it possible for Northern customers to pay a premium for more environment-friendly goods. For the time being, the market segment addressed by EPPs is still rather limited. EPPs cannot therefore be viewed as an immediate and comprehensive solution to developing country environmental and economic problems, but rather as an opportunity which should not be missed. An earlier move towards more environment-friendly production patterns might place these countries well ahead of their competitors, making it possible to take advantage of the anticipated expansion of markets for EPPs. Demand for these products is expected to grow in developed countries as customers increasingly adopt more environment-friendly consumption patterns. Markets for EPPs will also gradually emerge in developing countries, with increased environmental consciousness and levels of income.

This study will focus on natural-based products which can make substantiated claims to be environmentally friendly and which may have positive implications for developing countries' trade and development. The underlying factors of increasing demand for EPPs will be dealt with in chapter II. The supply side, i.e. the potential for the production of EPPs in developing countries, will be presented in chapter III. Chapter IV will focus on the identification of the main constraints facing increased production and sales of EPPs from developing countries and suggest possible ways to overcome these constraints.

II. GREEN CONSUMERISM AS A MAJOR FACTOR OF MARKET EXPANSION FOR EPPS

Environmentally motivated purchases have been on the rise in developed countries since the 1980s, both among individual consumers and among corporate and institutional/government buyers. This trend is strongly linked to growing environmental consciousness in society.

A. Individual consumers' behaviour

According to public opinion polls, a significant and increasing proportion of individual consumers prefer to buy environmentally sound products,[1] and some of them are even willing to pay a price premium.[2] It is suggested that, just as quality consciousness was the selling point in the 1980s, the environment appears to play the same role in the 1990s.

However, some warn against exaggerated optimism, affirming that, in fact, there may be a gap between consumers' intentions and behaviour. For the time being, most mainstream consumers value price and performance ahead of environmental qualities. As a result, the segment of truly environment-dedicated customers may be more limited than suggested by the polls.[3] Such customers are likely to be most common among the young, better off and better educated people living in economically buoyant regions. In this context, it should, however, be noted that, despite current limitations, a further shift of consumers towards more environmentally conscious buying decisions can reasonably be expected in the coming years.

The sensitivity of customers to environmental issues and its subsequent reflection in purchasing decisions may stem from a combination of different factors:

(a) interest in the environment. Increasing pollution and waste disposal problems in developed countries make people more sensitive to the issues of environmental protection. Starting by concerns over local problems (especially waste), this interest extends to the global commons and finally to the local environment in other parts of the world from which the products may be supplied to developed countries.

(b) health considerations. Consumers pay more attention to the effects of nutrition on their health. A shift in nutritional habits is observed towards the consumption of food produced without chemical inputs and free of chemical additives, which also gives these products an environmental advantage. The same concern is related to the adverse health impact of chemicals released from synthetic or chemically treated products, for instance. Special consideration is given to children's health.

(c) fashion. Fashion trends in the 1990s show a strong preference for products with a natural look and feeling and for "authentic" products and lifestyles, refraining from the use of artificial colouring, taste and additives. EPPs may well fit into this trend.

(d) interest in "third world" or "fair" products. A segment of consumers also favours and buys "third world" items in order to help the countries of origin by paying a fair price to producers in these countries. This is inspired by a feeling of fairness, equity and contribution to the redistribution of income on a global scale. Many EPPs belong to this category, combining environmental and social fairness considerations.

B. Corporate consumers' behaviour

Apart from individual consumers, corporate intermediate buyers and government agencies are taking an increasingly active part in the market for EPPs. Companies, which currently account for a larger part of the EPPs market than individual consumers themselves,[4] have started to attribute greater importance to environment-related issues in their purchasing policies. The reasons are stricter environmental regulations introduced by Governments, as well as economic considerations related to consumers pressure and to competitiveness issues. As a result, companies begin to be more careful in the selection of inputs and materials to be used in their production and sales. It should nevertheless be borne in mind that, especially in technical uses, companies still tend to favour price, product performance and tradition in using certain types of inputs over the product's environmental attributes.

One factor affecting companies' purchasing decisions is the introduction by Governments of bans on the use of certain substances or of more stringent phytosanitary standards. The extension of producers' responsibility to the waste disposal stage may also induce enterprises to seek more environment-friendly solutions as regards the choice of intermediate goods, including reusable or

recyclable materials.[5] This type of measure aims at putting into practice the polluter/user pays principle by internalizing external environmental costs of environment-unfriendly products, which would shift the competitive balance in favour of EPPs.

Facing growing pressure by environmentalist groups[6] and consumers, companies have been changing their behaviour, adopting more pro-environmental attitudes. They restructure their business strategies with extensive resort to environmental marketing, which makes the environment a major point of attraction for customers. By doing so, companies expect economic benefits in terms of increased sales and/or profits or reduced costs. The environment is perceived as providing some form of competitive advantage to the company.

Environmentally based marketing usually involves action to build up a positive "green" image of the company among the public, or the use of product-related environmental claims in market promotion. In the former case, companies strive towards being perceived as environmentally conscious across the whole range of their activities. They set measurable environmental targets, communicate with the public and work continuously to incorporate environmental concern into company decisions at all levels in a permanent fashion.[7] A modified form of this strategy might be applicable to a developing country's situation, aimed at building a green image of the entire country. In the latter case, the positive environmental effects are associated with a particular product which is advertised as having environmental attributes.

Companies wishing to be able to substantiate the environmental claims of their final products, including the environmental friendliness of the production process itself, have become more interested in the environmental attributes of inputs used in the production process. They frequently set their own certification schemes, use supplier questionnaires and issue purchasing policy statements. Environmental checks on suppliers do not only concern the product (input) itself; often the processing and production methods of supplying enterprises are looked into. In Europe, for example, suppliers may be asked to provide a "product environmental profile" to their corporate customers. Compliance with some socially oriented criteria regarding working and living conditions of employees may even be required.

C. Government procurement

Government procurement in the developed countries also increasingly favours making purchases of EPPs by institutional customers. It is estimated that the proportion of total consumption which can be accounted for by government procurement can reach up to 20 per cent in the United States, where the Federal government is the nations's single largest consumer, purchasing over US$ 200 billion worth of goods and services each year. This is probably the case of European and other countries, too.

In the United States, for example, environmentally-based guidelines have already been established for procuring paper products, lubricating oils, retreaded tyres, building insulation and cement or concrete containing fly ash. The Environmental Protection Agency has been working on general procurement guidelines which take account of environmental factors with a view to promoting markets for products and services that result in less risk to human health and the environment. Ultimately all Federal Procurement catalogues may contain information on the environmental attributes of products, along with performance and cost information.

III. IDENTIFICATION OF PRODUCTS WITH ENVIRONMENTAL CLAIMS

A. The concept of EPPs

For the time being, there is no universally adopted definition or concept of EPPs, and it is not likely that such a definition could be agreed upon in the near future. The complexity of the issue makes it very difficult, if not impossible, to provide really undisputed scientific proof of a product's environmental friendliness.

Work is under way on the use of life cycle assessment (LCA) for this purpose. According to the LCA concept, a product's life cycle can be represented as a circular movement that ties together resource extraction, production

(processing), distribution, consumption and waste disposal, all of them linked by means of transport. During all the different phases of its life cycle, the product has some sort of impact on the environment. LCA's purpose is to establish a record of these impacts during the whole life of a product ("cradle-to-grave" approach). Sets of criteria used in LCAs to assess the environmental impact of a product include, foremost, indicators related to the use of resources (such as consumption of energy and of renewable and non-renewable materials), the generation of emissions, effluents and solid waste and the contamination of the environment.

Effective LCA methodologies are still very much in the development stages and their results are often questioned or considered inconclusive or even misleading. Moreover, many LCAs that have already been carried out focus only on a particular aspect of the life cycle, particularly on the waste disposal stage, and neglect others. Finally, only a few LCAs have tackled the issue of natural-based products, while focusing mostly on their manufactured counterparts produced in developed countries.[8] The results of one of these few attempts concerning jute are summarized in table 1.

Despite skepticism concerning the practical applicability of LCA, the concept may be of interest for companies wishing to market EPPs, since it can be a useful instrument in order to:

(a) Identify environmental advantages of their products, which can then be capitalized on in substantiating claims during promotional campaigns;

(b) Provide evidence which helps to protect a product against aggressive external claims regarding its negative impact on the environment;

(c) Pinpoint potentially environmentally harmful phases in a product's life cycle which should be dealt with in order to improve the product's environmental record and strengthen its environmental claims.

Confronted with the lack of truly unambiguous evidence of environmental friendliness, Governments and especially companies have taken a rather pragmatic stance towards the issue. Government regulations and guidelines concerning EPPs either are based on a more or less comprehensive LCA or use other criteria, often of a qualitative nature, which reflect policy priorities in their respective countries. Businesses, eager to increase their sales, put emphasis on the environmental merits of their products, bypassing sometimes the more problematical attributes.

A pragmatic concept of EPPs is adopted in this study, since the objective is to draw attention to the opportunities EPPs represent for developing countries. The focus will therefore be on the most important positive characteristics of different products and, more particularly, on those which are relevant to the developing country context. It should be noted, however, that since an environmental advantage of a product on one account (e.g. biodegradability) may be associated with a disadvantage on another (e.g. pollution at the production stage), hardly any product can claim to be entirely environment-friendly. For this reason, environmental disadvantages will also be mentioned, where significant.

Table 1 - **Environmental impact assessment of jute and polypropylene**

	Jute	Polypropylene
Total energy consumption	3.75-8.02 GJ/t of fibre	84.3 GJ/t of fibre
Total CO2 emission	-1.6-0 t/t of fibre	3.7-7.5 t/t of fibre
Type of resources used	(+) renewable	(-) non-renewable
Production stage	(+) improves soil fertility; (+) reduces incidence of weeds and plant diseases; (=) retting waste is biodegradable, but resulting oxygen depletion in water can increase mortality of certain fish species	(-) nitrogen dioxides and sulphur dioxides are emitted into the air, contributing to "acid rain"; (-) waste water and solid waste contain bioaccumulating substances like heavy metals
Transformation stage	(-) petroleum-based mineral oil used in batching; (=) burning production wastes generates energy, but also pollutants; (-) dust and noise are major problems as regards work conditions	
Transport stage	consumption of energy 0.19-0.27 GJ/t	consumption of energy 3.9 GJ/t
Consumption stage	(-) mineral oils used in batching tend to migrate into the foodstuff from the packaging material	
Disposal stage	(+) biodegradable, without a negative environmental impact if suitable methods are selected (composting, production of biogas); (+) re-usable; (+) recyclable	(-) carcinogenic substances released into the environment; (-) plastic trash threatens farm animals, birds and wildlife; (-) the remains of drift nets kill marine animals

(+) stands for a positive impact
(-) stands for a negative impact
(=) means that findings are inconclusive

Source: "Jute and hard fibres: Overview of major current issues", UNCTAD/COM/71, Geneva 1995.

Note: All figures taken from "Environmental impact assessment of jute and kenaf" ESC:JU/IC 93/3, FAO, Rome 1993.

For the purpose of this study, **EPPs are** defined as **products which cause significantly less environmental harm at some stage of their life cycle (production/processing, consumption, waste disposal) than alternative products that serve the same purpose, or products the production and sales of which contribute significantly to the preservation of the environment.** (For detailed criteria, see box 1.)

Box 1

Criteria of environmental friendliness

The lower environmental harm (or higher environmental friendliness) of EPPs and their contribution to environmental preservation, which can be used to support the claims of developing country products of being environmentally friendly, are generally related to one of the following areas:

(a) Use of natural resources and energy

- Lower consumption of energy along the whole life cycle (natural-based products are usually less energy-intensive, particularly at the production stage, as compared with synthetics);
- Type of energy used (from renewable or non-renewable resources);
- Lower material consumption in production and distribution;
- Lower use of non-renewable resources, which are moreover preferably substituted by sustainably managed renewable resources;
- Use of otherwise wasted products;

Effective use of this type of environmental claims is often subject to a switch towards more energy- and material-saving technologies.

(b) Amount of waste generated along the life cycle

- Lower emissions of CO_2 and other environment-harmful gases, at the production, consumption and disposal stage;
- Lower or zero contamination of water and soil (agriculture refraining from the use of chemical inputs has a good record in this respect);
- Lower amounts of solid waste;
- Products are reusable;
- Products are recyclable or biodegradable (natural-based products have a certain edge in recyclability and are easily biodegradable).

Some of these claims can be made only if environmentally sound technologies or practices are introduced.

(c) Impact on human and animal health

- No toxic substances are contained in the product and no toxic residues are released from it at the production, consumption and disposal stage;
- No health hazards can occur at the production and disposal stage;
- Only natural ingredients and inputs are used in the production process (organic food, organic textiles);

(d) Preservation of the environment

- Product comes from a sustainably managed natural source (timber from a sustainably managed forest);
- Product contributes to a better preservation of an exhaustible natural resource (fish or shrimp bred on farms);
- Product enhances the value of a natural resource, contributing to its better preservation (forest by-products, spices, raw materials for the pharmaceutical industry, etc., which, if commercially used, increase the interest in the preservation of the tropical forest);
- Product has a beneficial impact, at its production stage, on the environment (products of organic agriculture improve soil fertility and affect positively the whole eco-system, including biodiversity).

It has been argued in recent years that the environmental friendliness of products reflects only one side of sustainable development (the attainment of which should be the final goal of the production and use of EPPs) and that

social friendliness should also be taken into account. According to supporters of this concept, the impact of a product ought to be assessed both on environmental grounds (in terms of its contribution to the preservation of the environment) and on social grounds (in terms of its contribution to the satisfaction of the basic needs of its producers). This perception reflects two interlinked trends in consumers' behaviour, namely green consumerism and ethical consumerism.

As yet, the concept of a combined environmentally and socially preferable product has practically not been reflected in government-issued regulations. A single possible allusion to this issue may be an occasional inclusion of health aspects of the working environment into standards for eco-labels. On the other hand, however, some socially responsible companies have begun to take into account social criteria in their internal certification schemes relating to their environmental checks on suppliers.

Social considerations have already been at the centre of alternative trade organizations' (ATOs) activities for the last two decades. After having focused for a long time on trade in handicrafts produced by the poor in developing countries, these organizations have recently moved from beyond this sector into agricultural products. As most farmers who are ATOs' target groups have hardly ever used chemical inputs, they are well placed for the production of EPPs. In order to respond to this new situation, ATOs started to combine their traditional "fair trade" or social criteria with those related to the environmental friendliness of products (for details, see box 2). The same trend is seen on the "environmental" side - organic farmers have been working towards incorporating social criteria into their previously environment-focused standards.

Although the current extent of alternative trade is still limited, the movement is growing. Retailers such as Oxfam, which ranks among the top 10 largest retail chains in the United Kingdom, the Max Havelaar Foundation in the Netherlands, involved in assigning a fair trade mark to coffee, or alternative brokers such as TWIN have already gained a good reputation. As evidenced by the experience of some ATOs, producers in developing countries have become aware of these market opportunities and have shown increasing interest in marketing their products through alternative trade channels.[9]

B. Major groups of EPPs

An important issue for EPPs is related to the credibility of environmental claims. Consumers who are willing to bias their purchasing decisions in favour of EPPs are sometimes confused by various arguments used in publicity campaigns or can lose confidence as a result of misleading environmental claims made by some manufacturers (e.g. claims to recyclability when no recycling facilities are in place, etc.). To avoid consumer distrust and disappointment, environmental claims should be verifiable, capable of clear public communication and, consequently, credible.

This study will classify EPPs according to the main environment-based arguments that can be used in promotional campaigns, with the aim of increasing the acceptance of these products by consumers. Three broad groups of products, with different approaches to be taken while dealing with this issue, can be identified, namely: (a) products which are more environment-friendly than petroleum-based competitors (at some stage of their life-cycle); (b) products which are produced in an environment-friendly way (production/processing stage); and (c) products which contribute to the preservation of the environment (see box 1 (d)). As regards this classification, it should however be borne in mind

Box 2

Fair trade criteria and EPP trade

The primary objective of alternative (fair) trade is to assist poor and disadvantaged producers in developing countries in reaching markets, by trading their products and paying remunerative prices that reflect the full costs of production while leaving sufficient amounts for contingencies and profit.

In order to qualify for this category the product has to comply with two major criteria:

1. **The product is traded on fair conditions**, which means that producers get a fair price for their products. The products ordered are partly pre-financed, and longer-term agreements are made between producers and importers.

As regards coffee, for example, the different ATOs have agreed on the following "fair" conditions:

- They pay the world market prices, or a so-called minimum price in case the world price falls below the minimum level. (From 1989 to 1993 the world market price was up to 60 per cent lower than the minimum ATO price). The minimum price is based on a calculation of the average cost of production and living costs of coffee producers in different countries. It includes also an amount for investment in production improvements.

- They pay a fixed extra charge for certified organic products. The amount of US$ 15 paid as an extra charge for organic quality per £100-worth of coffee is to cover the average extra cost of organic production.

- The buyer has to pre-finance at least 60 per cent of the minimum price if required.

- Purchase contracts must be valid for at least one year.

2. **Primary producers are directly supported**, which means that the price premium or distribution cost savings are passed on to them and may directly affect their well-being.

This can be ensured in two possible ways. The first one is that ATOs work directly with groups (cooperatives) of small producers, which is mainly the case of coffee. If the crop is grown on plantations, ATOs make agreements on the use of premiums with joint bodies consisting of representatives of the management and representatives of the majority of the workforce.

Fair Trade Marks have been conferred worldwide for coffee for several years now. Recently tea has been added to the list, and marks for sugar, cocoa, chocolate and honey will shortly be introduced.

that the above division is based only on the major environmental qualities of different products and that, if minor attributes are taken into consideration, the same product may also be put into a different product group (for example jute, which is more environment-friendly than polyethylene, can also be grown in a more environment-friendly way, i.e. organically). Some examples of products falling into the above-mentioned three categories are given below.

1. Products which are more environment-friendly than petroleum-based competitors

These are products which compete for consumers' favour with synthetic products, both in terms of price and performance. Examples are natural fibres, such as jute, biomass fuels or natural rubber, competing with polyethylene, petroleum-based fuels and synthetic rubber. Generic promotional campaigns are used to support and disseminate the environmental claims of these products. These campaigns are organized around major environmental attributes, such as, for example, biodegradability, quick renewability of the natural resource, and natural origin and look. It is, however, also advisable to be aware, using, for instance, the LCA approach, of environmental bottlenecks related to the generically advertised products (such as mineral batching oil residues in jute sacks, high use of chemical in the cultivation of some crops, etc.) and to try to eliminate or at least mitigate these problems. This may make it easier to cope with aggressive claims against these products. The main issues for this group of products are the need to increase price competitiveness, improve technical characteristics, capitalize more on environmental attributes and sometimes also develop new uses for these products.

(a) Jute and kenaf

Jute and kenaf currently compete with synthetic fibres, especially polypropylene, in most of their end-uses. Their main traditional application has been in the packaging market, as cloth and sacks, and in secondary carpet backing. Aggressive price competition from synthetics, which in addition gain from well-funded research focused on improvement of technical properties of polypropylene fibres, has led to the erosion of the jute market and to losses in market share. However, the rising concern over ecology and over the impact on the environment of the use and disposal of synthetic materials has revived interest in natural fibres. At the same time, new uses capitalizing on jute's environmental merits are being developed, and extensive market promotion campaigns have been launched to enhance consumption of jute and jute products. It is even more important in the light of the fact that raw jute is produced exclusively in developing countries and that also a great part of the processing and export of jute and jute products takes place in this part of the world. In addition, the cultivation and processing of jute and kenaf are relatively labour-intensive and hence job creating. As a result, they provide a significant source of income for the rural population in some developing countries, such as India, Bangladesh, China and Thailand.[10]

Jute shows a distinct competitive edge over synthetics in terms of a number of environment-related criteria along its life-cycle. First, energy consumption in the production/processing of synthetic raw materials is about 10 times higher than that needed for natural fibres. Second, whilst the total carbon dioxide balance (i.e. the carbon dioxide emitted during production/processing and transport minus the carbon dioxide taken out of the atmosphere) is neutral to positive for jute, synthetics' production and transportation are associated with considerable amounts of CO_2 emissions. Third, jute is a quickly (within one year) renewable resource, whereas production of polypropylene is based on the use of non-renewable fossil resources. Fourth, the major advantage of jute and the most appealing in relation to consumer' concerns is related to the waste disposal stage of the product's life. Natural fibres are fully biodegradable while, broadly speaking, synthetic materials are not,[11] although sizeable amounts of financial resources are being spent by the petrochemical industry to attain this goal in the future. Similarly, the currently available recycling technology for synthetic materials and waste

collection practices permit only a small proportion of synthetic waste to be recycled economically as compared with jute which is normally recycled except for the re-use of bags. Furthermore, when disposed of, synthetics may have a seriously damaging impact on the environment, due to the release of a number of toxic substances.

For the above-mentioned reasons, jute products seem to be particularly well-suited for uses where their environmental attributes give them a competitive edge over synthetics. Jute packing (sacks) lets moisture in and out and is therefore suitable for the packaging of a number of items where breathability is essential (grains, potatoes, etc.). Moreover, the reusability and recyclability of jute sacks may be an attribute, given the strict waste disposal regulations currently being adopted in a number of developed countries. The use of jute in secondary carpet backing may potentially expand owing to growing concerns over indoor air pollution by chemicals released from synthetics and over the dangers of flammability and smoke density/toxicity of synthetic materials. As regards non-traditional uses, the production of geotextiles, taking advantage of natural fibres' biodegradability, is considered to be one of the end-uses offering the greatest potential. Jute has a natural appearance and decomposes within 3-6 months once the vegetation becomes established. Quick renewability of fibre is a prominent feature in promoting the use of kenaf for the production of paper.[12] Non-traditional consumer items, such as floor and wall coverings, home textiles, bags and luggage, shoes and clothing, apart from environmental attributes, may rely also on consumers' preference for natural products and third-world items.

The main problems facing jute currently in international markets concern price and non-price competitiveness. As regards prices, measures to internalize fully the adverse environmental impact of the production and use of synthetics may be instrumental in increasing jute's competitiveness. Some steps have already been taken in this direction with new packaging regulations in developed countries which favour recyclable materials. As this is a rather long-term solution, cost-cutting initiatives can also be taken at all stages from jute farming to jute manufacturing. First, yield levels need to be increased through the development of new varieties with higher fibre content and greater resistance to insect pests and disease (e.g. by breeding jute and kenaf). Second, costs can be reduced at the processing stage by the implementation of new technologies and the use of more efficient machinery. In this context, there is a need for extension programmes transferring new technologies to the grassroots level.

In the non-price area, it is indispensable to improve both the technical and environmental attributes of jute products, so that they may better withstand competition from synthetic substitutes. For example, lighter cloth for sacks suitable for automatic filling systems would allow jute to recapture a part of its lost market share in packaging. Negatively perceived odour and fibre shredding in jute products could be addressed by developing new processing techniques. As regards environmental attributes, the credibility of jute environmental claims could be reinforced, especially through the introduction of less-polluting retting techniques and the substitution of vegetable oils for mineral batching oils. Mineral oils may leave traces in cloth which may eventually contaminate food packed in jute sacks. Better information and targeting of potential customers is also needed, especially when jute products are designed for technical uses. The problem is that users may not be aware of the existence of non-synthetic alternatives or of the technical and environmental superiority of these solutions. In consumer products, more emphasis placed on the environment-friendly and natural aspects of jute might influence purchasing decisions in favour of jute products, despite, perhaps, a

small price disadvantage.

(b) Biomass fuels

Biomass fuels could represent a more environment-friendly alternative to fossil fuels, especially petroleum-based fuels, which are, in fact, their main competitors. There are basically two types of liquid biomass fuels, namely bioalcohols and biodiesel fuels. Among the former, ethanol is produced mainly from sugar-rich agricultural products, such as sugar cane, whereas methanol can be made from any carbon-rich material, such as wood, but is mostly derived from natural gas. Biodiesel fuels are mainly based on vegetable oils. Gaseous biofuels can be obtained from agricultural products, crop residues and wood. Liquid fuels can be used in varying concentrations in blends with gasoline or in their pure state in engines specifically designed for this purpose. The use of biogas is mainly for electricity generation.

The principal environmental attribute of biomass as compared with fossil fuels relates to the global commons - the CO_2 cycle is neutral for biofuels while it is not for fossil fuels. Moreover, at the consumption stage, biomass fuels produce much less carbon monoxide (reportedly 50 per cent less in the case of ethanol, for example[13]), and are therefore praised for their clean air aspects. Another strong point in their favour is that they are produced from renewable and even quickly renewable resources, such as annual crops.

On the other hand, some negative environmental effects may occur at the cultivation stage, depending on the agricultural practices applied. As biofuels are not targeted for human consumption, standards for the quality of crops and for levels of pesticide residues could be less stringent, with a concomitant risk of an increased use of chemical inputs (in order to raise yields) and pollution of soils and waterways. During the production of ethanol, some liquid and solid pollutants are generated for which, however, waste treatment technologies are available. Gasification of biomass feedstocks generates some dust, waste water and ash. Unlike the waste from coal gasification, which must mostly be landfilled as a hazardous waste, the ash waste can be used as fertilizer.

Interest in biomass fuels stems essentially from several types of considerations. In the developed countries, these include concerns about growing levels of atmospheric pollution and also the need to address agricultural policy reform, namely the unsustainable costs of financing the overproduction of some food crops. In the latter case, conversion of land from food to non-food uses, which is moreover preferable from an ecological point of view, has been a major reason to consider seriously the production and use of biomass fuels. The reason for interest in biomass fuels has been different for developing countries. Countries which made major efforts in the promotion of biomass fuels did so mostly because of their need for an import substitute for fossil fuels. Since they are importers of petroleum and, hence, dependent to a great extent on fluctuations in its prices, they wanted to offset the negative impact of petroleum price instability on their economies and on their balance of payments through the development of fuels produced from domestic resources. In fact, the first substantial efforts of developing countries in this field go back to the period after the first oil shock of 1973-1974 (see, for example, the case of Brazil, summarized in box 3). Environmental concerns may also play a role in this respect. The same type of arguments in favour of biomass fuels can be used nowadays. It should, however, be kept in mind that in countries without surplus arable land and agricultural labour, biomass fuel feedstocks can compete with food crops and, as a result, may have adverse economic and social effects.

Box 3

Brazil's alcohol programme

Brazil is by far the world's leader in ethanol production, producing around 12.5 billion litres in recent years and consuming about 150 million tons of sugar cane annually.

Influenced by the rise in world oil prices of 1974, Brazil launched the world's first major fuel ethanol programme in 1975, PROALCOOL. Drawing on the country's vast resources of land and rural labour and its highly favourable conditions for sugar cane growth, Brazil has more than doubled its sugar cane area and more than tripled its ethanol production from half a billion litres in 1975/76 to 12.7 billion in 1991/2.

The programme, however, encountered a number of difficulties. First, there were considerable problems in adapting cars and other vehicles to the use of sugar-based alcohol instead of gasoline. These obstacles were overcome by domestic car manufacturers, with financial assistance from the state. The second and most important problem is the vulnerability of the programme to developments in relative prices between petroleum and sugar. Ethanol production received boosts in times of oil shocks and after the Gulf crisis when prices of petroleum climbed to their heights. However, once the price of oil started to fall, the programme immediately ran into financial problems, due to the lack of price competitiveness on the part of ethanol. The Government was permanently forced to subsidize the price of alcohol, making it substantially cheaper, and this became increasingly burdensome in periods of low oil prices. In 1989, high world sugar prices led many millers to forego ethanol production in favour of sugar, and Brazil was obliged to import ethanol during 1989/90 and 1990/91 in order to keep the programme operational.

The ethanol programme in Brazil is reported to have created about 600,000 new jobs in the ethanol sector and is now being praised for its clean air effects, which make it suitable especially for the urban areas of Sao Paulo and Rio de Janeiro. However, the gradual withdrawal of the government from subsidizing the use of ethanol and the ethanol fuel shortages in 1980/90 have lead to a constant decrease in the number of ethanol-driven new cars manufactured and sold in Brazil, from 90 per cent of the total in 1987 to some 15 per cent in 1991. Given the investment in the industry and the adaptation of cars to ethanol fuel, the future of the programme seems nevertheless to be assured, at least in the short run.

In both Europe and the United States, programmes to develop biomass fuels are multiplying. Ethanol, mostly made from corn, is currently the prime commercialized alternative fuel in the United States. The Clean Air Act required that by January 1995, cities with high levels of smog begin using reformulated gasoline (called gasohol), containing a certain portion of oxygenate which may be either ethanol or methanol.

In the European Union, farmers are granted subsidies of US$ 300 per hectare to take land out of surplus food production and put it into oilseed production for non-food use. Moreover, the Commission of the European Communities adopted a draft directive fixing the tax structure for biofuels at levels notably lower than those applicable to fossil fuels. Germany,

Switzerland and Italy have exempted biodiesel from 95 per cent of their highway tax. In Sweden and Finland, biomass energy is economically viable because taxes are levied on fuels such as petroleum products which harm the environment.[14]

The major problem currently hampering the use of biomass fuels is the lack of competitiveness vis-à-vis fossil substitutes. The solution to this problem is not immediately available, since both directions of action available to improve the situation are only possible in the long run. First, more funds and efforts are needed for research and development so as to make biomass fuels more economically viable. Second, internalization of negative external costs related to the use of fossil fuels would make biomass fuels more competitive. As seen above, some steps in this direction have already been taken in developed countries. For the time being, however, the main policy instrument to boost the consumption of these fuels is the subsidization, which is not always feasible in developing countries. As regards export prospects for developing-country-produced biomass fuels, they seem rather limited for the near future, since projected use in Europe and the United States is expected to be fully covered by domestic production. There is, however, some scope for local use in developing countries themselves, within the context of import substitution.

2. Products which are produced in an environment-friendly way

This group of products includes organically grown food and agricultural raw materials (competing with conventional production) or timber from sustainably managed forests (vs. unsustainable timber). As the products are basically identical, the need arises to distinguish between those which were produced in an environmentally friendly way and those which were not. Two instruments are used for this purpose, namely certification and eco-labelling. The objective of certification is to assess the product against standards of environmental friendliness. In the case of compliance, the product can be sold in the market. Certification is mandatory for some products or for products originating from some countries, for example for organically grown food in the EU market. By contrast, eco-labels are voluntary schemes used to convince customers of the environmental attributes of a product. Eco-labels can be likened to fair trade marks, which incorporate fair trade and sometimes also environmental criteria. Very few eco-labels have been attributed, for the time being, to developing country products. The absence of an eco-label does not preclude the product from being sold in the market, but the recovery of the price premium may become more difficult. Eco-labels may not be an appropriate solution for some products, such as industrial inputs, where buyers may prefer setting up their own internal certification schemes.

(a) <u>Organically grown products</u>

For the time being, organically grown products include mainly food items, some of them already grown and exported by developing countries, such as coffee (see box 4), cocoa, bananas, tea, vegetables, fruit, sugar cane, soya, nuts and others. Organic practices have, however, been spreading into other areas where consumers' health concerns are equally important. Cotton holds a prominent place among non-food organic crops.

In terms of standards to be complied with, organic agriculture is the strictest of more environment-friendly agricultural practices. Its main focus is on minimizing environmental damage and on sustaining or building soil fertility. Organic agriculture is commonly perceived as refraining from the use of chemical inputs, such as synthetic fertilizers, pesticides and herbicides or defoliants. Some flexibility exists, however, in this regard among various standards (see examples in table 2). More environment-friendly alternatives are

Box 4

Organic coffee

Coffee is currently the most important organic item produced and exported by developing country producers. Organic standards are now frequently combined with fair trade criteria in coffee trade. Since fair traders initiated the business, the share of purely "fair trade" coffee is still higher than that of fair+organic products. As a result, fair trade coffee accounts for about 2 per cent of the market in Germany, 2.5 per cent in Switzerland and 4.5 per cent in the Netherlands. By contrast, coffee grown under strict organic conditions is supplied to only 0.1 per cent of the German and 0.2 per cent of the United States markets. Consumer demand in Europe and in the United States appears nevertheless to be rising steadily since the mid-1980s.

Available data indicate the existence of about 40 organic coffee projects worldwide holding some form of certification in the early 1990s. Roughly 80 per cent of these involve Latin American producers, with Mexico, Costa Rica, Guatemala, the Dominican Republic and Haiti accounting for 61 per cent, and Peru and Brazil for the remainder. Twenty per cent of organic coffee projects are located in Indonesia, Papua-New Guinea, India and Madagascar.

The organic coffee that is currently on the market comes mostly from smallholder plantations which have links with organizations in consuming countries. Marketing is done principally through fair trade organizations, which provide assistance in capacity-building and in surmounting certification and labelling requirements in consuming countries, and which secure the products a niche in distribution outlets, often of their own. Perhaps one of the best known fair+organic[1] trade successes is Max Havelaar coffee, which guarantees a fair price to some 300,000 small coffee producers in 13 countries.

Under fair trade arrangements, payments are made directly to producers who are thus able to recover a higher portion of the final price. As a result, the developmental aspects of organic agriculture are strengthened. A union of indigenous Indian farmers in Mexico,[2] for example, used the environmental premium gained on exports of organic coffee through a fair trade organization also for communal development activities. They have set up infrastructures for the transport, storage, processing and export of their product. Another contribution was to public service, including an improved educational system in remote communities, a public transport system into the otherwise inaccessible mountain regions, shops stocked with basic necessities and a medical insurance system. As of the early 1990s, the union had a membership of 37 communities with a total of more than 3,000 families. Organic farming has served as a vehicle to a better standard of living, in addition to ensuring the sustainability of agriculture.

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1. It is estimated that 30 per cent of the price premium is attributable to environmental and 70 per cent to social advantages in the case of Max Havelaar coffee.

2. Union de Comunidades Indigenas de la Region del Istmo (UCIRI) in Oaxaca, southern Mexico.

suggested to replace chemicals, such as sound rotations, particularly incorporating legumes, the careful management and use of manure and crops wastes, the use of appropriate cultivation techniques, natural and biological pest and disease control measures (see, for example, box 5), and mechanical and other non-chemical weed control techniques. Specific standards

may be prescribed for individual commodities (such as coffee or bananas), aimed at the conservation of the environment, particularly of forests and biodiversity, the protection of workers' health, etc. Before full organic status is achieved, the land must undergo a conversion period of generally one to three years.

Table 2 - **Certification schemes for organic products**

Certification scheme	Nature	Status	Products covered	Eco-label	Use of synthetic chemicals
EU's Council Regulation 2092/91 1/	mandatory (legal norm)	operational	plant products	no	banned (except some synthetic fertilizers)
US Organic Food Production Act	mandatory (legal norm)	under preparation (operational in 1996)	plant and animal products	envisaged as optional	banned except emergency cases
Codex Alimentarius FAO/WHO 2/	voluntary	under preparation	plant and animal products	no	generally banned
International Federation of Organic Agriculture Movements (IFOAM) 3/	voluntary	operational	plant and animal products	no	generally banned
Rainforest Alliance ECO-O.K. programme	voluntary	operational (O) or under preparation (UP)	bananas (O), coffee, vanilla, cocoa (UP)	yes (ECO-O.K. label)	controlled

Note: The term mandatory means that products which do not comply with relevant standards are denied market access. The compliance with voluntary standards is generally not sufficient in this regard. It seems, however, that, for example, IFOAM certified producers will be able to export to the US without difficulty according to the draft proposal of the relevant law. Voluntary standards serve usually as guidelines (Codex Alimentarius) or to provide a guarantee to consumers of organic provenance of the product (private schemes).

1/ For more details see: EEC Regulation "Organic Agriculture", IFOAM 1993.

2/ For more details see e.g., Revised Draft Guidelines for the Production, Processing, Labelling and Marketing of Organically/biologically Produced Foods, CX/FL 93/8 - Add.1, Codex Alimentarius Commission, Rome 1993.

3/ For more details see Basic Standards for Organic Agriculture and Food Processing, IFOAM 1994.

According to standards, strict requirements need to be observed not only in production, but also during subsequent stages of the life cycle - storage, transport and processing. It has to be ensured that organic produce is neither mixed nor switched with conventional produce - they cannot be stored or transported together. In general, organic food and textiles should only be processed by mechanical, physical and fermentative processes, or a combination of these. A limited range of additives is allowed for food, most of which are natural. In cotton processing, for example, only water-soluble dyes are used, and chloride for bleaching is eliminated by using hydrogen peroxide. In the drying process, finishing is by mechanical means without the use of chemicals, e.g. formaldehyde. The objective is to produce final products with the smallest possible negative impact on health and the environment.

The environmental benefits associated with organic farming are achieved mostly during the production stage. Better agricultural practices and elimination of chemical inputs allow for improvements in soil fertility, enhance natural eco-systems and prevent water and soil pollution. Concomitantly, farmers' dependence on expensive chemical inputs is reduced. Organic agriculture

Box 5

Natural pesticides

One of the serious problems in organic agriculture is the lack of non-chemical alternatives for pest control. Great scope therefore exists in this field for natural-based pesticides, which appear to be safer both for people's health and the environment. For example, pyrethrum and neem oil and extract, which are supplied by developing countries, are often authorized for use in organic agriculture, even though only in the event of breakdown and not as a matter of routine prevention.

Pyrethrum is a daisy-like size flower of the chrysanthemum family. The blooms of these plants contain six pyrethrin esters which are natural insecticides. The product is biologically friendly, specific to cold-blooded fauna, rapidly degradable in natural sunlight - leaving no residue, and safe to warm-blooded animals. The world's major exporter of pyrethrum is Kenya, but projects are also under way in other countries with suitable conditions, mainly in East Africa. According to feasibility studies undertaken by a US-based society, Agro Management Group, Inc., pyrethrum should be a profitable crop, fetching up to US$ 750 per hectare which is two to three times more than cotton or coffee and comparable only to prime vegetables.

The neem tree belongs to the mahogany family and is native to India and Burma, although it is also grown in Africa. Extracts from its seeds and leaves could make ideal insecticides - they attack pestiferous species, leaving warm-blooded animals and beneficial insects unharmed; they are biodegradable; they appear unlikely to quickly lose their potency to a build-up of genetic resistance in the pests; and they disrupt the production of growth hormones, thereby preventing insects from reproducing. In tests over the last decade, it was found that neem material can affect more than 200 insect species, as well as some mites, nematodes, fungi, bacteria and even a few viruses. Success, equal to DDT, Dieldrin and other synthetic insecticides, has been reported, for example, on cotton, tobacco, rice and coffee pests. Neem production and processing provide employment and generate income in rural communities. It could be a valuable export item as well - a ton of neem seed already sells at African ports at more than twice the price of peanuts.

Although the possibilities of natural pesticides seem almost endless, some impediments have still to be overcome before their potential can be fully realized. First, the greatest obstacle may simply be a general lack of credibility, or even awareness concerning what these products are and what they can do. Second, the supply may not be as reliable as would be required for their expanded use. Third, chemical companies have already developed synthetic alternatives to pyrethrum and patented the extracts of the natural product itself in the case of neem. There is therefore room for scientific research to provide convincing evidence of natural pesticides' relevant properties. Ways should also be found to resolve the intellectual property problem so that the producing countries can obtain a fair share of the economic benefits derived from the commercial use of their products in patented natural pesticides.

also has a significant social and cultural impact, as it is very closely allied to indigenous production systems and knowledge. As a result, farmers are likely to adopt it relatively easily. Moreover, it uses less energy and is more labour-intensive, which helps maintain rural employment. This aspect of organic agriculture may be of special attraction for developing countries.

Despite the undeniable contribution of organic agriculture to the improvement of the environment at the upstream stage of the life cycle, the advantages at the consumption stage are perceived as dominant by consumers. The greater health value is likely to be more important for people in, for example,

Scandinavia, German-speaking countries and Benelux, while the better taste of organic food may be what people most value in France and Italy.

Organic food is still mainly sold in niche markets. The share of organic products is currently about 1 per cent of the food market in industrialized countries, with notable exceptions being Denmark, Austria, Germany and Sweden, where a share of about 2 per cent is common.[15] Figures are not available for organic cotton. There is, however, apart from fashionable clothing, considerable demand in connection with medical gauze and baby clothing.

Organic products currently sell at premium prices which range from 20 to more than 100 per cent higher than those of conventional products[16]. They suffer from a cost disadvantage vis-à-vis conventional products, mainly as a result of higher production, storage, transport, distribution and certification costs.

Lower yields, especially during the transitory period before soil fertility is fully restored,[17] may sometimes be a problem for organic farmers, since they contribute to higher production costs. On the other hand, expenditures on external inputs are lower, and current price premiums may lead to higher income per hectare. An important cost that discourages a switch to organic farming is the need to leave the field fallow (in the case of field crops) or apply principles of organic production (in the case of tree crops) for two to three years before the crop can be certified as organic, thus foregoing significant revenues during this period.

Similarly, processors of organic products are disadvantaged as a result of the high initial costs of transition to more environmentally sound production methods and also due to the need to use exclusively natural dyes and ingredients, which are often more expensive and not readily available.[18] However, as demand for organic products increases, this cost disadvantage is likely to diminish as competing suppliers of inputs appear.

The overall impact of higher organic produce prices on the final product's price may not be so important if the organically grown crop is only a production input. In this case the raw material accounts only for a minor part of the total cost of the final good.[19]

Markets for organic products are expected to expand further in the coming years. An important factor that will increase consumer demand for organically grown products is the decision by some developed country Governments to make conscious efforts to switch their own agriculture to organic methods.[20] As consumers are presented with greater numbers of domestic organic products, their preferences for those products in general, including imported ones, are likely to increase as well.

For the time being, developing country producers are disadvantaged vis-à-vis domestic producers in industrialized countries, since the latter receive assistance and subsidies from their Governments. These subsidies may be geared to facilitating the conversion from conventional to organic farming[21] or intended as an ongoing support to organic farmers.[22] However, developing country producers may still be able to establish themselves in developed markets. This is undoubtedly the case of products which do not compete with local production. Moreover, there is some scope even for competing items, because the degree of self-sufficiency in organic products is predicted to be well below 100 per cent (about 60-70 per cent in Germany, for instance)[23] and imports will therefore be inevitable to satisfy domestic demand. The adverse effect of subsidies in developed countries may be partly offset by the relative ease of switching to

organic production (because of generally lower current use of chemical inputs) and by lower labour costs in developing countries.

In any case it seems very important for the future of the organic market to narrow the price differential between organic and conventional produce. For example, higher distribution costs may be brought down if supplies increase. Consequently, if products are readily available and consumers can get them without greater effort and at lower prices, demand is likely to rise considerably.

(b) Tropical timber from sustainably managed forests

There is growing worldwide concern over deforestation caused particularly by the unsustainable utilization of natural tropical forests. The process has resulted in substantial tropical forest loss, and an area of around 17 million hectares is still deforested annually. The rate of felling is rising most rapidly in South-East Asia, particularly in the Philippines, Malaysia and Indonesia, and in some countries of Latin America (Brazil, Colombia).[24] Tropical deforestation is deemed responsible for the aggravation of global warming, since it brings about the emission of greenhouse gases when trees are burned (among which CO_2 is the most important) and results in biomass loss, thus reducing the global forests' carbon sink capacity. Another negative effect is the irreversible loss of biological diversity.

Four factors, three of them predominantly social in nature, contribute to deforestation: (a) conversion of natural tropical forests lands into agricultural areas (the most important factor); (b) use of forests to extract fuelwood (the population pressure in developing countries considerably accentuates these two problems); (c) the practice of shifting agriculture; and (d) unsustainable commercial logging.

Among the above-mentioned issues, international and national action has addressed mostly the problem of sustainable logging practices. For the time being, no universally applicable concept of forest management sustainability has been adopted, and individual countries and certifying bodies use their own sets of criteria. A guideline definition has nevertheless been worked out by the International Tropical Timber Organization (ITTO). In ITTO's perception, **sustainable forest management should provide a continuous flow of forest products and services, without undue reduction of the forest's inherent values and future productivity and without undue undesirable effects on the physical and social environment**. The general concept of sustainability has further been elaborated by individual certification schemes into more detailed sets of criteria related to forest management (such as delimitation of forests, allocation to productive purposes, annual allowable cuts, provisions regarding rotation, post-harvest control, assistance for regeneration and others), the protection of biodiversity, prevention of water, soil and air pollution, etc.

The social aspects are often taken into account as well with a view to promoting the socio-economic development of communities in the areas affected by forestry operations. For example, the Forest Stewardship Council (FSC), composed mainly of NGOs with only a minority participation of business interests, is working on criteria which, in addition to ITTO's concept of sustainable forest management, also include human rights issues. According to FSC, all forests should be managed in ways that are (a) environmentally appropriate, (b) socially beneficial, and (c) economically viable.

In recent years, environmental NGOs, particularly in Germany, the Netherlands and the United Kingdom, have led, through the mass media, extensive campaigns against the use of tropical timber, as this was perceived to be encouraging the destruction of the tropical forest. These initiatives have brought unprecedented pressure upon the timber trade, since public opinion has become much more sensitive to this issue. As a result, a number of importing countries have taken measures to discourage trade in tropical timber which does not come from sustainably managed resources (see box 6).

Box 6

Restrictions on timber imports

Growing concern in developed countries about the consequences of deforestation has led to a request for reduced importation of rain forest timber. In 1992, Austria introduced a law on obligatory labelling of goods made from or containing tropical timber. The same law also provided for voluntary quality marks for all kinds of timber and timber products from sustainable forests. As a reaction, the ASEAN timber-exporting countries sent a communication to the GATT questioning the Austrian law. They felt that the labelling requirements were discriminatory since timber from temperate climates did not need to be marked, and that the marking would give a negative image even if the import of timber was not totally prevented. Timber exporters also protested because Austria decided unilaterally what would constitute sustainable forest management even if no international consensus on such criteria exists. As a result, the Austrian Parliament amended the law so that, from 1 April 1993, only the voluntary quality mark remained which will be issued upon application for all kinds of timber from sustainable exploitation.

Estimates carried out by the ITTO and independent researchers suggest that only between 1 and 10 per cent of tropical forests are managed sustainably.[25] In the same vein, it is estimated that about 1.5 million cubic metres of timber and timber products were certified as sustainable in 1993 but not all of this entered the international market. The total volume of certified timber thus represents less than 0.5 per cent of the world trade in industrial roundwood, sawnwood, plywood and veneer combined.[26]

As yet, there are only four certification systems for tropical timber which can be considered operational,[27] all of them operated by NGOs: (a) the Forest Conservation Programme of Scientific Certification Systems (USA); the Smart Wood Certification Programme (SW) of Rainforest Alliance (USA - for details see box 7); (c) the Responsible Forestry Programme of the Soil Association (UK); and (d) SGS Silviconsult (UK). All these schemes aim at improving forest management while also providing tools for market promotion and consumer assurance. SW also includes developmental objectives and attempts to provide assistance to community-based operations.

All the certification systems mentioned above make use of the life cycle concept and include two main components: (a) certification of sustainability of forest management and (b) product certification. The former covers the extraction stage of forest operations, whereas the latter examines log transportation, storage, processing and distribution of end products. Consumption and disposal stages are not dealt with in timber certification schemes. The criteria utilized appear to be generally compatible with the criteria of the FSC, but the final assessment standards are always agreed upon with the client.

Box 7

Smart Wood Certification Programme

Smart Wood (SW) is a programme of the Rainforest Alliance, a New York-based non-profit organization founded in 1986 to help conserve tropical forests. SW was started in 1990 and is now reported to be the oldest and largest independent forestry certification programme in the world.

The objectives of the programme are: (a) to identify and promote acceptable sources of timber that do not destroy forests; and (b) to certify companies that sell products manufactured from SW certified sources. Certifications are based on SW guidelines, which contain about 100 different criteria in three basic categories: (a) sustained yield of forestry production; (b) maintenance of environmental functions, including watershed stability and biological conservation; and (c) positive impact on local communities and workers.

Acceptable sources of timber are certified as either "well-managed" or "sustainable". So far only six "well-managed" sources have been certified (Brazil, Costa Rica, Honduras, Indonesia, Mexico and Papua New Guinea), as no sites have satisfied enough criteria to be certified as "sustainable". It is estimated that output from SW-certified sources is over 1 million cubic metres per year. Companies involved in timber processing and sales are certified through a process of monitoring of the flow of wood products from the source through manufacturing to sales. Twenty companies have been certified so far.

The sustainable management of forests implies additional costs for producers. The extent of these costs varies according to the definition of sustainability, with an important bearing on competitiveness. In particular, some attempts have already been made to assess these costs in Indonesia[28] and the Philippines.[29] Although these estimates do not work with full internalization, it appears that the costs of logging may increase from 25 to 100 per cent. More studies are, however, needed to provide convincing evidence on the issue.

Costs of certification[30] may also add to the overall price disadvantage of sustainable products. The inspection costs of sustainable management appear to be in the range of US$ 0.30 to 0.60 per hectare in developed countries but are likely to be higher for developing countries, as more fieldwork may be needed due to data problems and the need to use expatriate assessors. It is estimated that the cost of product certification may range up to 1 per cent of the border price. External monitoring of certifiers would be another additional cost which may have to be borne by the industry and which may push the above cost estimates upwards, possibly by as much as 100 per cent. It is debatable, however, whether if all the costs related to internalization should be passed on to consumers.

Despite the low overall share in total demand, it seems that the demand for certified timber exceeds supply in the primary markets (the United States and the United Kingdom). It is generally correlated with income level (within a country) and environmental awareness. As for the type of products, there appears to be proportionally more demand for certified timber in high-value-added consumer products like furniture than, for instance, in building products.

There is evidence that some consumers are willing to pay a premium for sustainably produced timber products, if certified. This willingness is, however, likely to be only partially reflected in actual purchasing behaviour. Studies[31] carried out on the issue confirm that traders and consumers prefer price and quality (finish, design and construction) over sustainably managed source of wood. There is as yet no convincing evidence on an existing price premium for certified timber and timber products in the market, except for very limited market segments. Higher relative prices may therefore induce substitution for non-sustainable timber.

3. Products which contribute to the preservation of the environment

Products which contribute to the preservation of the environment belong to this category of EPPs, among them, for example, all products which enhance the value of the tropical forest (spices, pharmaceutical raw materials, nuts harvested in the forest, etc.). They may sometimes compete with synthetics (pharmaceuticals or synthetic flavours, for example). Major attention has to be paid to the sustainability of harvesting as well in order to enhance the contribution to the environmental preservation. In order to enhance the products' sales, public awareness campaigns seem to be the best solution. This study will elaborate in more detail on one particular group of such products, namely **non-timber forest products** (NTFPs).

The commercial use of non-timber forest products may be a viable tool for increasing interest in the preservation of forests and biodiversity because of economic benefits derived from them.[32] Harvesting such products can also make forest protection more economically and socially attractive to local communities and gain their active support.

This is even more the case given the importance of NTFPs for local employment. These products are often the basis for local craft production and small-scale industries. Employment is thus generated not only in harvesting NTFPs, but also in the processing and marketing of these goods and their derivatives. While large-scale timber harvesting is mechanized and requires large capital investments, gathering NTFPs needs a relatively large amount of labour and modest initial investments. This sector is therefore particularly suitable for countries with labour surpluses, as is the case in many developing countries endowed with forests.

NTFPs cater essentially to the needs of local inhabitants, and if exported they are almost exclusively sold in niche markets. Despite this fact, they have undeniable export potential. The collection and export of non-timber products can be a major source of foreign exchange in some countries.[33] On the other hand, as compared with timber exports, the value of individual NTFPs is still rather small and, hence, it may not be realistic to expect that they will contribute much to solving developmental problems globally. They may nevertheless have an important positive local impact. Harvesting of NTFPs is, however, not necessarily benign, since it can easily lead to depletion of the resource if adequate control mechanisms are not in place.

This section will present a brief overview of only those products which already have an export record, no matter how rudimentary their markets might be. Among these are fibres, food items, pharmaceutical, toxins, aromatics, and biochemicals.[34]

Alternative wood sources of forest provenance (rattan, bamboo) seem to be dominant NTFPs in terms of direct and indirect employment[35] and export earnings.[36] In South Asia, climbing palms or rattans are commercially the second

most important forest product after timber. Their main use is in furniture production, though they are extremely versatile, with a wide range of traditional uses, such as handicrafts. Rattans are notably important commodities in Indonesia *(see box 8)*, *Malaysia*, the Philippines, Sri Lanka and Thailand. Similar in use, bamboos are even more widespread in China, Bangladesh, India, Thailand, the Philippines, Viet Nam and several African and Latin American countries. Increasing demand for cane for furniture manufacture has in some cases led to overcutting. For this reason, Indonesia, the Philippines and Thailand now ban the export of raw canes, and the export of semi-processed and processed canes from Malaysia is prohibited in order to conserve the supply for domestic industry. In general, it is desirable to process raw rattan into manufactured goods within the producer countries to add value, generate increased incomes, and create employment.

Foods include a wide range of exportable items, such as nuts (see box 9), spices, sweeteners, food additives and aids, fruits or mushrooms. Among spices, cardamom is an example of a successful export product. It is the fruit of a plant characteristic of the undergrowth found in the evergreen forests of India. Fruits of wild cardamom are collected and sold by the local tribesmen, but much of the present day production comes from plantations. A vogue for health foods in the EU, Japan and United States has boosted demand for natural sweeteners like honey in recent years. In some tropical countries (the United Republic of Tanzania, for example), trade in honey and other beekeeping products such as beeswax and royal jelly is a larger contributor to the national exchequer than all other forest products put together. Production of honey has also assumed high priority in the Philippines, Brazil and India, for instance. As regards food additives and aids, gum arabic is on the list of permitted substances in the processing of organic food. It is a resin tapped from acacia, notably in Sudan, which supplies 80 per cent of the world market in this commodity. Gum arabic is widely used as a stabilizer or fixative in food. Great market potential also exists for tropical fruit, especially in the production of tropical fruit juices where new and more sophisticated non-alcoholic drinks are in demand. Mushroom can be an important source of foreign exchange for some countries as well. This is the case of Bhutan, for example, with target markets in India, Nepal and Bangladesh. Morels are also widely gathered in Pakistan and trade internationally in large quantities.

Box 8

Rattan production in Indonesia

Indonesia is the world's largest producer of rattan (90 per cent of world output), which is usually considered as the most economically successful NTFP. Kalimantan, the Indonesian part of Borneo, supplies more than half of the world's rattan. Of the 600 species of rattan, those that yield canes of good colour and suppleness are most sought after as raw materials for cane furniture. They abound in the island's interior, inhabited mainly by indigenous tribal people.

Prior to the current ban on raw rattan exports, most of the rattan collected to make furniture was exported unprocessed to Hong Kong or Singapore. Now it is brought downstream by traders, processed to a rudimentary stage of manufacture and then sold to mainly Chinese exporters. The manufacture of mats and carpets is, by contrast, generally done within Kalimantan. In many rattan-processing or carpet-making enterprises, women of the Dayak tribe comprise 30 to 40 per cent of the workers. The mat and carpet industry is growing and is beginning to rival the timber industry as a major employer and source of rural income in the area.

Work is now under way to establish rattan plantations in the areas where wild stocks have been depleted by over-collection, to establish more processing centres nearer the sources of collection, and to clarify the terms of access and title to forest rattan collection. Ways of utilizing a greater variety of rattan species in trade are also being investigated.

Among the best-known of NTFPs are medicinal substances like the antimalarial drug quinine. Even today, when the pharmaceutical industry has a ready capacity to synthesize most naturally occurring substances, the active ingredients in 25 per cent of all prescription drugs come directly from medicinal plants. Not all of them, however, grow in forest habitats. Remedies for diseases that currently baffle the world's medical researchers, such as cancer or AIDS, are being actively sought by botanists and pharmacologists in woodlands, forests and other wild plant habitats around the world.

Another significant use of forest chemicals is in cosmetics and perfumery. There is a huge market for essences, particularly ones that are new and exotic. The cheapest perfume contains at least 40 of them, the more expensive ones being even more complex.[37] The essential oils of many forest trees and plants (bay rum tree from West Indies, camphor tree from East Asia or eucalyptus from China, for example) find markets in perfumes, soaps, shampoos and other personal care products.

Some toxins contained in forest plants and trees are potential pesticides. This is the case of safrole, traded as "sassafras oil", obtained from the wood of a wild-growing species of Lauracea. Safrole is converted into piperonyl butoxide which plays a critical role as synergist for natural pyrethrum-based insecticides which are much less effective alone. Today, China is the major producer of sassafras, overtaking Brazil.

Biochemicals include substances replacing synthetic chemicals in their various end-uses. Natural dyes such as indigo belong to this group, as well as tannins with colouring properties (mangrove tannin, for example). Tannins, which are generally extracted from barks of trees, can also be used to preserve and soften animal hides and leathers in an environmentally more friendly way. The bark of acacia may be the source of glues used in the manufacture of particle

Box 9

Brazil nuts

Brazil nuts (also called Amazon nuts) are, together with rubber, one of the main non-wood forest products extracted in the Amazon region. They represent a significant source of income for some local communities. Brazil supplies about 75 per cent of the world market, followed by Bolivia and Peru. As the internal market represents only 3-5 per cent of total production, the Brazil nut industry is highly dependent on exports. The United States is the world's largest importer of in-shell nuts and it is second after the United Kingdom in imports of shelled nuts. Brazil nuts comprise about 1.5 per cent of the international edible nut market but their share has been constantly falling over the last two decades as a result of a decline in total production, in favour of other types of nuts. Two main problems must be solved in order to gain greater market share for Brazil nuts: insufficient supply and relatively high production costs.

The deforestation of Brazil nuts' producing regions has contributed to the loss of production. In addition, only slightly less than half the potential area in the Amazon is exploited for the extraction of nuts today. Transportation towards centralized processing plants is too costly to justify their being gathered from isolated sites. Moreover, prices paid to producers may not be high enough to stimulate production as new opportunities open up for extractors to earn more money outside the sector in activities such as prospecting for gold or hiring out their labour.

Prices paid for Brazil nuts at different points of the market chain are derived from international prices and passed down to extractors who receive about 12 per cent of the fob export price of in-shell nuts. The cost of transportation to processing plants and the earnings of the intermediaries approach 15 per cent and processing costs amount to 50 per cent of the export price. One of the reasons for the very low share received by extractors is the monopsonistic situation of buyers and the lack of market power for individual producers.

The processing itself involves several time-consuming and labour-intensive stages. Production costs in large processing units in cities are high, owing to costs of transportation from remote areas, losses due to spoilage during transport and generally higher wage levels in plants located in urban zones, as compared with rural areas. Experience from Bolivia shows that small processing plants buying their raw material from the same border region and paying the same price to extractors are able to export at lower prices than large Brazilian processors.

One of the solutions proposed to increase the competitiveness of Brazil nuts is decentralization of processing (as economies of scale are insignificant), which could cut transport as well as labour costs and lead to a larger part of final price accruing to the gatherers, while remaining internationally competitive. For example, the Cooperativa Agro-Extractivita de Xapuri, the only small production-processing-export venture owned and operated by extractors, has been able to double the price paid to them, thanks to a reduction in costs through decentralized processing.

Another option to increase production and lower production costs is to plant Brazil nut trees. Just planting trees close to the extractors and to the processors will lower the time and distances of gathering and therefore reduce the production costs. The time from planting to first commercial production is shorter for planted trees and they can do very well in most soils of the Amazon, being resistant to major diseases and pests even if concentrated or planted in homogeneous stands.

boards and plywood, both valuable sources of foreign exchange, as in southern Africa. Lac, the resinous secretion obtained from the body of a hemipterous insect and produced in India, Thailand, China, Indonesia, Viet Nam and the Lao People's Democratic Republic, finds a variety of uses in plastics, adhesives, wood finishing, polish and others.

A major obstacle to marketing NTFPs is the irregularity of supplies, which is partly due to the high dependency on climatic conditions and seasonality, as well as problems in maintaining quality standards. Moreover, many products are perishable and cannot be kept fresh for a long time. Post-harvest losses,

including those during transport, are also high. NTFPs can therefore be exploited only if adequate facilities are developed for their processing, transportation and storage. It is also difficult with current organizational structures to provide quantities which might interest potential importers-manufacturers.[18] Producers should therefore try to work more closely together so as to be able to supply economically viable quantities. Another problem is how to introduce new NTFPs on the market, which is a costly and time-consuming operation.[19] It therefore seems easier to develop the potential of products which are already on the market.

Another issue is the sustainability of harvesting NTFPs. Efforts to make production viable often work against the preservation of the forest, since low-level exploitation of the "hunter-gatherer" type, though not altering any ecological relationship, may not be economically attractive to modern man. There is thus a strong case for plantations that raise particular commercially interesting species. This may, however, create additional competitive pressure on wild NTFPs themselves.

Forest management can become more sustainable if this option proves advantageous for the local population. Forest residents are unlikely to protect forest resources if they do not have clear rights or guaranteed access to them. Moreover, a great part of the revenues from NTFPs is often appropriated by external entrepreneurs at the expense of local communities. In this context, increased participation of local producers and their associations in the marketing of their products may help stimulate their interest in the sustainable management of the forest. In the same vein, value added accruing to local communities could be enhanced through local and regional processing. Reliable evidence on the contribution of individual NTFPs to forest preservation and to the well-being of forest dwellers might also increase the attractiveness of these products for environmentally and socially conscious consumers.

IV. CONSTRAINTS ON INCREASED PRODUCTION AND TRADE IN EPPs FROM DEVELOPING COUNTRIES AND WAYS TO OVERCOME THEM

The above review of EPPs which can be supplied by developing countries reveals that there is an untapped potential in this area. The efforts to increase production and sales of EPPs are, however, confronted with a number of constraints ranging from the lack of competitiveness through insufficient information about EPPs to inadequate marketing. This section aims at identifying major constraints that impede EPPs development and at suggesting the direction of possible remedial action.

A. Price competitiveness

EPPs often tend to be more expensive than their synthetic or environment-unfriendly competitor products. For example, biomass fuels, if not subsidized, cost twice or even three times more than their fossil substitutes. Organic production may imply cost increases ranging from 10 to more than 100 per cent, depending on local conditions. The costs of sustainable logging are estimated to increase from 25 to 100 per cent as compared with conventional practices.

1. Internalization of environmental costs and benefits

One of the main reasons for the cost differential is the fact that first, environmental benefits provided by EPPs are not fully remunerated (through price

premiums) and second, their competitors are not penalized for environmental damage they cause since the related costs are not fully reflected in the prices of these competing products. The resulting cost disadvantage for EPPs might be attenuated, in the longer run, by getting these prices right.

The adoption of policies aimed at internalizing negative environmental externalities appears essential to achieve efficiency and to protect the environment. Full scarcity costs should eventually be charged for resource depletion, and full damage costs for environmental degradation. Concomitantly, positive environmental externalities arising from the production and use of some commodities[40] or related to environment-friendly production methods,[41] should also be internalized through higher prices for the products concerned. As a result, both internalization of negative externalities (discouraging unsustainable production and consumption patterns) and remuneration, in the form of a premium, for environmental services (stimulating sustainable patterns) would help achieve environmental sustainability.

Such policies, however, seem unlikely to be adopted on a large scale in the near future. Governments are concerned about the possible negative impact on their country's economic growth (and employment) of penalizing environment-unfriendly products. Producers may not contemplate voluntary internalization, i.e. a shift towards environmentally more sound practices, due to the cost impact on their competitiveness and market share, particularly where they internalize unilaterally. Furthermore, there is still not enough unambiguous evidence regarding the real impact of internalization on competitiveness, which makes producers reluctant to internalize on their own. This is even more true since there is no guarantee for internalizing companies that they will be compensated for higher costs by passing them on to consumers or gaining an environmental premium. Moreover, consumers in the developed countries may only be willing to accept a certain amount of premium, which is usually assumed to be around 20 per cent of the price. Cooperative multilateral approaches to internalization, involving most producers, might be an appropriate way to avoid these concerns, especially for traded products.

Governments could take the initiative in the design of policy instruments for internalization. A first step in this direction could be to eliminate subsidies which implicitly favour environment-unfriendly products or production techniques. An example of this would be subsidies on pesticides, fertilizers or irrigation water, which are already being phased out in a number of developing countries, though not always on environmental, but rather on budgetary grounds.

A second step could be to make environment-unfriendly producers and consumers pay the real cost to the environment of production and consumption. Governments can intervene through regulatory measures, such as setting stricter standards (health standards, packaging standards, standards regarding the use of certain inputs, for example bans on some pesticides or quantitative restrictions on the use of some chemicals, etc.). For example, new packaging legislation in some European countries could favour environment-friendly natural fibre packaging. The Clean Air Act in the United States creates space for increased use of environment-friendly biomass fuels. Market-based instruments can also be used to this end. In agriculture, taxes or import duties on chemical inputs are suggested, for example, as an incentive for farmers to switch to organic methods. In Sweden and Finland, taxes are levied on fuels such as petroleum products which harm the environment. Sustainability in forest management can also be fostered through properly established property rights or conditions stipulated in forestry concessions.

2. Transition costs

The shift towards environmentally preferable practices inevitably entails a temporary increase in costs. These transition costs may be linked to a change of technology in favour of a more environmentally sound alternative, which may imply a purchase of new equipment. A similar problem arises for biomass fuels, since they sometimes require modified combustion engines. In the case of organic agriculture, yields are generally lower during the conversion period in which organic methods are being introduced because of lower chemical inputs and also as a result of the learning process needed to absorb fully the new production practices. Moreover, products cannot yet be certified as organic during this period and price premiums cannot be achieved.

For these reasons, financial assistance to producers may help them bridge this transitory period. This is the usual practice in the EU, where temporary subsidies are granted to farmers to encourage them to shift toward organic agriculture. In the case of biomass fuels, the Government may also provide assistance for the modification of engines and for the acquisition of biofuel-driven vehicles. Given the financial constraints faced by developing countries, subsidies may frequently not be feasible. Governments could nevertheless try to facilitate access to rural credit by small farmers or producers in order to enable them to invest in alternative technologies or to bridge the conversion periods in the case of a switch to fundamentally different cultivation methods. To the same end, external assistance may be sought from international institutions and/or consuming countries in the framework of their development assistance programmes. The funding could take the form of long-term concessionary loans, guaranteed by the Government of the recipient country. Repayment could be linked to the sales of EPPs produced. In a number of cases the initiative to produce EPPs in developing countries has come from developed country companies which were looking for suppliers, or from NGOs which are specifically involved in fair or organic trade. In these cases, either a partnership or joint venture made it possible to absorb the costs of transition.

As regards organic agriculture, the possibility to sell "transitional" products at a price comprising a part of the expected environmental premium may help mitigate the conversion cost problems. This is, for example, the option envisaged by the International Cotton Advisory Committee. According to its proposal, cotton produced without chemicals in the first and second year would be referred to as transitional, being certified as organic B cotton. Some flexibility in terms of the length of the conversion period may also be useful, especially in cases when the initial level of pollution, due to previous agricultural practices, is rather low.

3. Production costs

Some EPPs may be produced at higher costs not only in the short, but also in the long run. This may be due to the lack of competitive technologies, as in the case of biomass fuels, or due to the depletion of nutrients resulting from previously used conventional agricultural practices in the case of organic agriculture, for example.

The situation may, however, change in the longer run. To this end, more research is needed into reducing the production costs of EPPs and increasing crop yields. There is large scope for technology transfer, both North-South and South-South, and for drawing on traditional environment-friendly practices in developing countries. New technologies could be developed, for example, for biomass fuel production, which may be more cost-effective than current

technologies. In the case of jute, yield levels need to be increased through the development of new varieties and the application of cost effective agricultural practices. At the stage of processing of EPPs, costs can be reduced, apart from the implementation of new technologies, through the use of more efficient machinery. The use of by-products, such as agricultural waste, may also improve the economics of production. A higher value added generated in the country may have the same effect. Similarly, the commercialization of NTFPs may contribute to the sustainable management of forests. For some items, the costs of production are expected to fall drastically with the attainment of commercially viable scales of production. As regards organic agriculture, there is not enough evidence on the long-term cost effect and, consequently, findings on the issue are inconclusive.

4. Certification costs

EPPs that are produced in an environment-friendly way sometimes need to be certified as so produced, which adds to the already high production costs. Certification costs represent a serious burden for organic farmers in developing countries, especially when they have to rely on expatriate certifiers. The fees, which are roughly between DM 500-1,000 per year per organic farm in Germany, are even higher for developing country farmers due to costs related to the transport and stay of a Western expert in the country. It is affirmed that the cost of one day's work for an expatriate inspector is equal to one-year's wage for an agricultural worker in a developing country.[42] Organic textile producers also complain about high certification costs.[43]

A solution may be to support gradual capacity-building in the area of certification in developing countries, with a view to reducing certification costs (see Bolivia's experience, as summarized in box 10). The first step would be to train local inspectors who would work with an accredited developed country inspection body. This could resolve the problem of lack of confidence in local certification capacities, since external participation may lend credibility to national certification schemes. The second step would be, with the support of the Government, to build a credible certification system and to seek accreditation or recognition of this system in importing countries. For example, as regards certification in organic agriculture, four countries (Argentina, Australia, Switzerland and Israel) are on the EU list of countries whose certification systems are recognized as equivalent to the EU. As a result, exporters from these countries can export to the EU on the basis of their domestic certification.

5. Distribution costs

Since EPPs often remain niche products and are traded in small quantities, producers have to bear higher transport, storage and marketing costs. Organic products, for example, need to be transported and stored separately and under stricter conditions than conventional produce. For these reasons, fixed costs related to the distribution of EPPs are higher per unit, which affects these products' competitiveness. Where feasible, it would help to increase traded volumes so as to be able to take advantage of economies of scale. Producers of NTFPs or organic farmers could combine their capacities in order to supply larger volumes of products. Similarly, passing from niche to mainstream would help to cut the distribution costs of a number of environment-friendly items.

B. Information

The full potential of EPPs is often not duly exploited for two main reasons: (a) producers are not aware of the opportunities which the production

Box 10

Cooperation in building a national certification system in Bolivia

Organic cocoa was first exported from Bolivia in 1987, certified entirely by foreign inspection bodies, with all the consequences in terms of high costs and dependence on external certification sources and marketing companies. The AOPEC (Asociacion de Organizaciones de Productores Ecologicos de Bolivia), founded in 1991, launched an ambitious certification capacity-building programme. It was assisted by a German certification agency, Naturland, one of those accredited by the EU.

A Bolivian certification scheme has thus been set up, adapted to local agroecological and cultural conditions while conforming also to IFOAM and EU standards. Local inspectors began to inspect and certify the products in 1993. Since 1994, the programme has been jointly managed by the AOPEB and Naturland in the framework of co-certification. At present, 77 per cent of all Bolivian cocoa exports are certified as organic and sold to consumers in developed countries under the label of Naturland.

The AOPEB is currently able to satisfy all the certification needs of small organic producers in Bolivia and is also beginning to receive requests from plantations. Its activities have expanded beyond cocoa into coffee and Brazil nuts. The association has been officially recognized in its certification capacities by the Bolivian Government, and is now seeking accreditation by IFOAM and recognition by the EU, with the purpose of enhancing its independence in the area of certification.

Among the principal merits of the programme are: (a) the reduction of certification costs by half (from an average of US$ 4,000 to US$ 2,000) as a result of using local inspectors; (b) increased awareness among producers, who have been consulted on norms, of accepted production practices and market requirements in developed countries; and (c) higher returns to farmers as a result of direct sales to customers in OECD countries, bypassing intermediaries.

of EPPs may represent and they lack knowledge of potential markets; and (b) consumers are not well informed about the technical and environmental attributes of EPPs, as well as about potential suppliers.

1. Information for producers

Producers need information on environmentally sound technologies (EST) and production practices for the production of EPPs. Governments, seconded by the private sector, could support applied research focused on EST and tailored to their country needs. New uses for traditional products (such as the use of jute for the production of geotextiles, pulp and paper or composites) could also be looked into and new EPPs might be developed, on the basis of local resources, to the stage of commercialization. There is, for example, an enormous untapped demand potential for rainforest products with environment-friendly attributes which might be identified and popularized.

Concomitantly, Governments could contribute to a wider adoption of EST by disseminating information via extension services and education and training programmes for producers, since knowledge about adequate production practices adapted to local conditions is crucial for the improvement of EPPs' record. Moreover, as successful EPP production ventures may induce other producers to

follow the same path, model farms or production sites could be set up to this end, with assistance from the Government (for a complex programme of government support in the area of organic agriculture in China, see box 11). External advice on the establishment of such farms could also come through a South-South exchange process. International organizations can also contribute to the dissemination of knowledge through training programmes or the setting up of databases related to the issue (see box 12).

Marketing intelligence is another type of knowledge which is of utmost importance to producers. General data on production, exports, imports andprices, or data related to market access, e.g. certification and packaging requirements, import barriers, etc., need to be provided on a regular basis. Once again, international organizations may be well placed to provide assistance to developing countries in this respect (see box 13).

Box 11

Government support for organic agriculture in China

In China, organic agriculture is considered an effective way of developing the rural economy as well as of protecting the rural environment. In order to promote its development, the National Environmental Protection Agency of China set up the Organic Food Development Centre in 1994. The Centre is responsible for the development of organic food, including training, research, inspection, issuing of organic certificates and promotion of organic farming. Among the main activities of the Centre are:

(a) Experimental production of organic rice, wheat, strawberries, onion, lettuce, tomato, Chinese cabbage and fish breeding;

(b) Development of Chinese organic food, namely organic tea (in cooperation with the Dutch certification agency SKAL) and soybeans (in cooperation with a Japanese partner);

(c) Elaboration of organic food standards for China;

(d) Systematic publication of foreign documents concerning organic agriculture in Chinese translation; arrangements are also made for publishing the journals "Organic Agriculture in China" and "Newsletter of Chinese Organic Food";

(e) Training workshops on the development of organic food, attended by government officials, research and university faculty staff, enterprises and grassroots participants; around 40 specialists have already been trained.

(f) Promotion of the national organic market, targeted at young people who need organic food for their babies and children (as a result

Box 12

International initiatives in the area of EST

1. UNEP International Cleaner Production Information Clearinghouse (ICPIC)

ICPIC has been jointly developed by the United Nations Environment Programme (UNEP) and the U.S. Environmental Protection Agency (US EPA). It is designed to transfer technical, policy, programmatic, legislative and financial expertise on cleaner production to the public.

ICPIC assists in: (a) establishing projects and programmes in specific countries, regions, municipalities or companies; (b) identifying technical process options to make products and their production cleaner; (c) identifying means to reduce waste and liabilities; (d) identifying upcoming events, conferences, training sessions, seminars and workshops; and (e) locating documents and cleaner production experts.

There are seven primary databases currently active on the system:

- International Cleaner Production Calendar of Events;
- Countrywide Cleaner Production Programme Summaries;
- Corporate Cleaner Production Programme Summaries;
- Cleaner Production Case Studies;
- International Contact List of Experts;
- International Legislation Summaries.

ICPIC is accessible to anyone with a personal computer, a modem, communication software and access to a public telephone line. There is no direct cost for using ICPIC such as user fees or on-line charges. However, the user will incur indirect costs when accessing the system, specifically the communication costs of calling via international telephone line or national packet switching network.

2. UNIDO National Cleaner Production Centres

The United Nations Industrial Development Organization (UNIDO) and the Industry and Environment Programme Activity Centre of the UNEP have jointly launched a new field programme on a pilot basis to promote cleaner production. This programme will support national cleaner production centres in approximately 20 countries for a five-year period.

The national cleaner production centres will: (a) improve awareness of the problem and provide information; (b) offer training and human resources development in cleaner production and clean technologies; (c) carry out demonstration projects in order to ensure a multiplier effect; and (d) provide the link and ensure cooperation between and with national government agencies.

The centres will work mainly with small and medium-scale enterprises. They will be located preferably in existing institutions and managed by experienced nationals of the countries concerned. In the first phase, funding will be provided for eight centres for three years. The second phase will allow for two more years of funding of the eight centres and for five years for 14 or more new centres, depending on the availability of funds. To date, around 40 organizations and institutions from developing countries have transmitted requests to become national cleaner production centres. The final selection, based on a shortlist of nine institutions, was expected to be made by the end of 1994.

Box 13

International databases with commercial information

1. The UNCTAD GREENTRADE database

UNCTAD has been mandated to establish a GREENTRADE database on environmental measures with a potential impact on trade. In the organization there is already a database on trade policy measures (tariffs and non-tariff measures), called Trade Control Measures Database, as well as commercial data on trade flows of individual products. These data are disseminated through the **TR**ade **IN**formation **S**ystem (TRAINS). It has therefore been decided to integrate GREENTRADE eventually into TRAINS. In the final phase, the user will be provided with commercial data, as well as data on market access, including environmentally motivated measures, in one information package.

A pilot version of GREENTRADE covering a number of countries is being developed thanks to support from the Governments of the Netherlands and Italy, and should be available in the near future. The project is also supported by Collaborative Research on the Economics of Environment and Development.

GREENTRADE refers to product measures which are imposed or endorsed by Governments with the stated purpose of protecting the environment or public health. It does not cover voluntary measures taken by the private sector, measures implemented at the local government level and process standards and regulations as such. It includes, however, product measures which are used in relation with production processes and methods.

The pilot version of GREENTRADE has three functions:

GLOSSARIES allow the user to learn basic facts and concepts relating to environmental issues which may be relevant in the context of international trade.

VIEW allows the user to see basic information on product measures and strategies adopted in specific countries in response to environmental concerns.

DATABASE allows the user to edit information contained in the GREENTRADE database or add new information to it.

GREENTRADE enables encoding and retrieval of information using a personal computer. Access to it will be unrestricted and free of charge for UNCTAD member States. The database will be made available through focal points in individual countries.

2. The ITC PACKDATA

The ITC has identified the lack of basic technical and commercial information as one of the major constraints hindering effective packaging in most developing countries. To answer this particular need, the ITC has created a computerized information system called PACKDATA.

PACKDATA has more than 2,500 records containing references to information concerning packaging. These records have been collected from articles, textbooks, handbooks, conference papers, experts' reports, etc. The original hard copy material, with the exception of voluminous publications which have to be purchased directly from the publisher, are delivered to the recipient country upon signature of an agreement. Field stations using PACKDATA are expected to introduce locally screened records into the database and to send these records to ITC Headquarters periodically.

The access to this information is, at least initially, free of charge. A reasonable service fee might be applied in the future. One set of reproduced hard copy material for each country is also available free of charge. Shipping costs should, if possible, be covered by the field station.

2. Information for consumers

Consumers may not have enough information about the existence and availability of particular EPPs. At the same time they may lack knowledge about the positive environmental attributes of these products, as well as about their quality and performance, which is expected not to be inferior to conventional products.

Information about quality is particularly important for those who use EPPs as inputs in agriculture and industry. In this case, reliable scientific information about a product's physical and chemical properties and its performance is indispensable for increasing EPPs' competitiveness. Moreover, there is often resistance caused by reluctance to changing an input even if no major technological problems exist and no additional costs are involved. Thus, it falls primarily upon the producers of environment-friendly inputs, as well as on public institutions, professional associations and NGOs, to provide the scientific data needed by users.

Information related to the environmental advantages of EPPs should also be transmitted to consumers. This is especially relevant for individual consumers or environment-conscious companies, since mainstream consumers still relegate environmental attributes to a lower position than price and performance criteria.

The first issue is to provide information in such a way that it is perceived as credible. Although there can be no undisputed proof of products' environmental friendliness, this should not prevent the acceptance of a product by the market. In the longer run, the credibility of environmental claims may be better documented by using the results of LCA. There appears, therefore, to be a need for methodological improvements in LCA to permit a serious use of such methods to ascertain the environmental advantages and disadvantages of products. In the meantime, however, certification and labelling, as well as a convincingly green image of the producing or marketing company or country, may serve as an assurance to consumers. Publicizing the importance of environmental benefits that occur mainly in the producing countries and those which are not immediately obvious to the consuming public (as in the case, for example, of forest-friendly products and products made from wastes) would be an important step towards increasing the competitiveness of EPPs. In order to raise the consciousness of consumers, it would help if the NGO community and other public pressure groups such as the media were involved in such activities.

As regards products which are not amenable to certification and ecolabelling schemes, such as industrial inputs or natural-based pharmaceuticals, pesticides and food additives, credible research into their environmental attributes needs to be expanded. Initially it could focus, in the case of industrial inputs, on the particularly strong and weak points of such products, with a view to emphasizing the former and improving the latter. Environmental product profiles, which analyze product groups (unlike ecolabels which analyze products individually) may also be important instruments for providing information to professional users. Generally they present a description of the product, environmental data, process technology data and guidelines for, in particular, repairing and recycling the product, and for final disposal. Work on this issue has already been carried out by the UN Economic Commission for Europe.[44]

The second issue is to disseminate the information on environmental attributes of EPPs once it is available. This can be done in generic or product-

related marketing campaigns which promote a product on environmental grounds. Since generic promotional campaigns usually exceed the capabilities of one national producer, it might be advisable for developing country producers from one or more countries to cooperate among themselves, or to use the services/assistance of an international producers' association or an (international) organization that specializes in this area. For example, the International Trade Centre UNCTAD/GATT, in cooperation with the International Jute Organization, launched an extensive promotional campaign on jute and sisal, built on these fibres' environment-friendly attributes.

C. Marketing

Many EPPs, such as NTFPs, for example, are new products, and introducing them to the market is therefore an important step. As this is a costly and time-consuming operation (it takes 5-20 years according to various estimates), which, moreover, is not assured of success, it is sometimes suggested that the market potential of products that are already available should first be developed since they offer the best chance of capturing international markets and, thus, generating increased income in the short term. The resultant profits can then be reinvested to diversify production through the addition of other items.

Other EPPs are still mostly sold in niche markets, such as third world, fair trade or organic food shops. Two problems arise from the niche character of these products. First, consumers may be very interested in buying EPPs, but not willing to look for them in the few specialized shops and to travel some distance to reach these shops. Product availability is therefore an impediment to growth in sales. Second, low traded volumes are normally associated with higher unit distribution costs which make EPPs less price competitive and, hence, less attractive to traders and consumers.

An obvious solution is to promote these products from the niche to the mainstream market, thereby increasing the quantities supplied and reducing the corresponding prices. In this case, new market outlets are necessary. The options are, for example, (a) setting up a chain of smaller supermarkets specializing in a particular group of products (organic foods), (b) introducing EPPs to the same retailing outlets which trade in conventional items, such as supermarkets, or (c) in the case of organic food again, targeting restaurants of large hotels, catering services or canteens providing services for government officials. Government procurement guidelines favouring organic products would be highly desirable in this respect. For example, organic food is already available in the canteen of the German Parliament.

The shift to the mainstream is often hampered by the lack of reliable supplies of adequate quantity and consistent quality, especially for products used as inputs in production processes. This is a prerequisite for the acceptance of such products by large producers, distributors and supermarkets in developed countries in the case of organic foods, NTFPs or jute, for example, where a year of bad crops or delays due to problems of transportation can make customers switch to more reliable synthetic competitors from domestic or nearby origins.

Supply-side measures to increase the volume and reliability of supplies are therefore important. The supply of commercially viable quantities of EPPs can be achieved by associating small producers in cooperatives, for example. As regards NTFPs, where collection from dispersed places may not be profitable, a solution might be to set up a commercial system of cultivating these wild forest products within the framework of integrated agro-forestry farming. Direct marketing channels may eliminate intermediaries and allow for a higher part of

the final price to be passed on to producers, thereby motivating them to increase production. The same effect could be attained if a fair trade or environmental premium could be achieved. Post-harvest losses could also be reduced as a result of faster shipment to final customers and better storage and transportation facilities. Such changes are likely to require technical and organizational assistance from Governments or, in particular, buyers.

ENDNOTES

1. For example, in Germany the proportion of customers who would buy an environment-friendly product rather than another rose from 57 per cent in 1981 to 72 per cent in 1991.

2. A study of American consumers found in 1990 that 90 per cent of those interviewed would pay more for EPPs. The amount of acceptable premium differs from poll to poll, ranging generally from 5 to 10 per cent or more in Europe, North America and Japan.

3. See, for example, J. Salzman, SC Johnson (Wax) Ltd; "Greener product policy in practice"; in Green Goods, The Second International Conference on Product Oriented Environmental Policy, Stockholm, Sweden, 1994.

4. Intermediate goods and services may account for up to 40 per cent of the total production and consumption (see Green Products by Design: Choices for a Cleaner Environment, Congress of the United States - Office of Technology Assessment).

5. In Germany, for example, the charge for recovering packaging is set by the German Dual System, the reference body for recycling charges, at 0.20 DM/kg for packaging made from natural fibres as compared with 3.00 DM/kg for plastics.

6. These groups often organize campaigns or boycotts of products perceived as contributing to deforestation (beef grazed on deforested pastures, wood originating in unsustainably managed forests) or to the extinction of endangered species (dolphin-unfriendly caught fish).

7. For example, 3M, Xerox or Dow and Johnson Wax can be listed among these companies.

8. According to OECD data (An Overview of the Life Cycle Approach to Product/Process Environmental Analysis and Management, OECD 1994), 45 per cent of LCAs carried out in developed countries were dedicated to packaging, some 11 per cent to waste-disposal-related issues, 9 per cent to chemicals and 8 per cent to building materials.

9. For example, EFTA (European Fair Trade Association, conferring a fair trade TransFair mark, working with more than 550 producer groups in 44 countries, with a turnover coming close to 100 mil. ECU in 1994) reports a growing number of enquiries received from producer groups in developing countries wishing to sell their products under fair trade conditions. In order to be able to respond to these demands, EFTA is considering expanding the scale of its operations.

10. For example, more than 12 million farm families are engaged in the cultivation of jute in the Asia-Pacific region.

11. Competition in this field, however, may emerge for natural fibres from bioplastics, which are also produced from natural and, hence, renewable materials, mainly vegetable oils or starch. Recent research seems to have substantially advanced in improving their biodegradability. If this trend is confirmed, this could have a negative impact on natural fibres, but at the same time, new markets may open to developing country vegetable oils.

12. The Phoenix Pulp and Paper Company, for example, has already been producing paper pulp from kenaf at Khonkaen, Thailand, for some years.

13. "The World Sugar Market", UNCTAD/COM/35, Geneva 1994, p. 13.

14. "Identification of means by which the competitiveness of natural products with environmental advantages could be improved", TD/B/CN.1/25, UNCTAD, Geneva 1994, pp. 11 and 13.

15. U. Hamm, "Marketing strategies for organic products in China", mimeo, 1994.

16. F. Blake, "Organic Food Production", World Agriculture 1993, Sterling Publications Ltd., London 1993, p. 22.

17. Yield losses are sometimes reported to reach as much as 30-50 per cent.

18. For example, a Turkish firm engaged in organic clothing reported that the use of natural dyes in garments' production might imply a cost increase of around 45 per cent, while the use of organically grown cotton would raise the final price by around 60 per cent.

19. For example, the cost of chocolate bars would increase by about 1 to 2 per cent if twice the current market price was paid for organically grown cocoa.

20. For example, 10 per cent of Swedish agriculture should convert to organic farming by 2000, while 50 per cent of farmers in the region around Salzburg (Austria) and 25 per cent of farmers in the land of Hessen (Germany) should be growing organic products in a few years.

21. Germany, for example, has supported farms during a five-year conversion period by paying US$ 180-300 per ha and year.

22. The EU set up an optional programme for its member countries in 1993 whereby organic farmers get subsidies ranging from US$ 80 to 240 per ha and year.

23. U. Hamm, " Marketing strategies for organic products in China", mimeo, 1994.

24. Trade and the Environment - Towards a Sustainable Playing Field, Environmental Advisory Council, Sweden, 1994.

25. T. Hpay, " The links between market conditions and intensity of use of forest resources", UNCTAD/COM/12, Geneva 1992, p.23.

26. B.H. Ghazali and M. Simula, Certification Schemes for All Timber and Timber Products, ITTO, Yokohama, 1994.

27. A number of other schemes are under preparation, two of them conceived by developing countries themselves: Brazil's CERFLOR and a scheme in Indonesia.

28. "Manpower development of Sarawak forest sector", ITTO pre-project report PPR 30/94 (I), State Government of Sarawak, Malaysia 1994.

29. R. Paris and I. Ruzicka, "Barking up the wrong tree. The role of rent appropriation in sustainable forest management", Environmental Office Occasional Paper No.1, Asian Development Bank, Manila 1991.

30. Figures in this paragraph are taken from B.H. Ghazali and M. Simula, Certification Schemes for All Timber and Timber Products, ITTO, Yokohama, 1994.

31. See, for example, D. Winterhalter and D.C. Cassels, United States Hardwood Forests: Consumer Perception and Willingness to Pay, Purdue University, West Lafayette 1993; and Mori and WWF, Survey of Public Attitudes towards Tropical Rainforests and the Environemnt, 1991.

32. It is suggested that in western Amazonia, for example, humid tropical forest could produce an overall annual income of at least US$ 200 per hectare from non-timber forest products if managed on a sustainable basis.

33. In India, for example, non-wood products account for around 60 per cent of forestry exports. Indonesia, Malaysia and Thailand have also witnessed rapid growth of export revenues from NTFPs.

34. The International Trade Centre UNCTAD/GATT has published market surveys and monographs on trade channels concerning some of these products, such as edible nuts, honey, spices, furniture, and others.

35. A conservative estimate puts the number of people involved in collecting, trading and processing rattan alone in South-East Asia at half a million.

36. South-East Asian export earnings from finished rattan are estimated at nearly US$ 3 billion.

37. J.W. Clay, Report on Funding and Investment Opportunities for Income Generating Activitites that Could Complement Strategies to Halt Environmental Degradation in the Greater Amazon Basin, WRI/Center for International Development and Environment, 1992, p. 38.

38. For example, the Xapuri Brazil nut shelling factory produces 70 metric tons of nuts per year which is an eight-hour shift consumption of M&M Mars in the manufacture of Snickers candy bars.

39. The time needed to introduce a new product is estimated at around 5 years for foods, 10 years for personal care products and 20 years for pharmaceuticals.

40. Such as preservation of biodiversity in the case of biodiversity-rich products or attenuation of waste disposal problems in the case of biodegradable products.

41. Such as organic agriculture which improves soil fertility, reduces erosion, preserves biodiversity, etc..

42. Discussion at the Fourth IFOAM International Conference on Trade in Organic Products, Frankfurt, March 1995.

43. See, for example, "Report on the Workshop on Eco-labelling and International Trade", TD/B/WG.6/Misc. 2, UNCTAD, Geneva 1994.

44. "Final report of the Task Force on Environmental Product Profiles", ENVWA/R.90, ECE, Geneva 1994.